

Claims

The invention claimed is:

1. A method for performing block level incremental backup operations for a file, especially for a large and/or sparse file, said method comprising the steps of:

backing up said file to create a backup copy of said file;

processing a write request relevant to at least one block of said file by storing changes in information for said file and by providing an indication that information stored in said at least one block of said file is new data; and

backing up said file using at least one select block having said indication that information stored in said at least one block of said file is new data.

2. The method of claim 1 in which said indication is stored in inode data for said file.

3. The method of claim 1 in which said indication is stored in indirect blocks referenced by inode data for said file.

4. The method of claim 1 in which said backing up of at least one select blocks is further determined based on a time stamp associated with said at least one block.

5. The method of claim 4 in which said further determination is based on two such time stamps.

6. A method for retrieving incrementally backed up block level data, especially from large and/or sparse files, said method comprising the steps of:

providing two time stamps to a file system in a read request; and

returning information with respect to changes in said block made between times indicated by said two time stamps.

7. A method for backing up sparse files, said method comprising the step of:

writing to a backup file in a write request to a file system in which at least one user specified portion of said file is defined to have a specified value and in which the size of said at least one portion is specified by said user.

8. The method of claim 7 in which there are a plurality of said portions.

9. The method of claim 7 in which said specified value is zero.

10. The method of claim 8 in which said specified value is predetermined.

11. A method for performing block level incremental backup operations for a backed up file, especially for a large and/or sparse file, said method comprising the steps of:

processing a write request relevant to at least one block of said file by storing changes in information for said file and by providing an indication that information stored in said at least one block of said file is new data; and

backing up said file using at least one select block having said indication that information stored in said at least one block of said file is new data.

12. A computer readable medium having computer executable instructions for causing a data processor to perform block level incremental backup operations for a file, especially for a large and/or sparse file by carrying out the steps of:

backing up said file to create a backup copy of said file;

processing a write request relevant to at least one block of said file by storing changes in information for said file and by providing an indication that information stored in said at least one block of said file is new data; and

backing up said file using at least one select block having said indication that information stored in said at least one block of said file is new data.

13. A data processing system containing executable instructions, in memory locations of said data processing system, for causing said data processing system to perform block level incremental backup operations for a file by carrying out the steps of:

backing up said file to create a backup copy of said file;

processing a write request relevant to at least one block of said file by storing changes in information for said file and by providing an indication that information stored in said at least one block of said file is new data; and

backing up said file using at least one select block having said indication that information stored in said at least one block of said file is new data.